

Message (Digitally Signed)

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**From:** JERRARD, CATHERINE V GS-13 USAF HAF AFCEC/CIBW [catherine.jerrard@us.af.mil]  
**Sent:** 9/4/2015 4:01:42 PM  
**To:** Wayne Miller [Miller.Wayne@azdeq.gov]; steve@uxopro.com; bo@praxis-enviro.com  
**CC:** Smallbeck, Donald R. (donald.smallbeck@amecfw.com) [donald.smallbeck@amecfw.com]; Devon Phelan (dphelan@terratherm.com) [dphelan@terratherm.com]; Pearson, Stuart C. (stuart.pearson@amecfw.com) [stuart.pearson@amecfw.com]; WATKIN, GEOFFREY W CTR USAF AFCEC AFCEC/CIBW [geoffrey.watkin.ctr@us.af.mil]; d'Almeida, Carolyn K. [dAlmeida.Carolyn@epa.gov]; Davis, Eva [Davis.Eva@epa.gov]; Gorm Heron (gheron@terratherm.com) [gheron@terratherm.com]  
**Subject:** FW: ST-12 weekly report questions  
**Attachments:** image005.jpg; image006.png; smime.p7s

Wayne/Steve/Bo--

Please see information below.

Cathy

//SIGNED//  
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-----Original Message-----

From: Devon Phelan [mailto:dphelan@terratherm.com]  
Sent: Friday, September 04, 2015 10:12 AM  
To: Davis, Eva  
Cc: d'Almeida, Carolyn K.; Steffen Griepke; Smallbeck, Donald R.; JERRARD, CATHERINE V GS-13 USAF HAF AFCEC/CIBW; (Geoffrey.Watkin@cn-bus.com) (Geoffrey.Watkin@cn-bus.com); Pearson, Stuart C. (stuart.pearson@amecfw.com); Gorm Heron  
Subject: RE: ST-12 weekly report questions

Hi Eva,

The Air Stripper and Accelerator 1 were down beginning on 7/29/15 due to the Air Stripper fan failure. The system was originally designed for one Air Stripper to handle the full liquid flow rate and we have utilized the second Air Stripper and Accelerator 2 to handle the process vapor and liquid flow to even out the load on the system. The non-condensable wellfield vapor extraction rate has been very consistent (see figure below) although we have seen variations in the wellfield calculated steam extraction rate. The observed two past increases in steam/condensate production in the vapor phase are both close to or after depressurization cycles conducted in the LSZ. The first LSZ depressurization cycle was initiated on 6/16/15 (although LSZ steam injection rates were reduced on 6/8/15 due to boiler issues and full depressurization occurred on 6/22/15). The increase in steam extracted in the vapor phase was observed starting on 6/16 and ending around 6/21. The second cycle was initiated on 8/12/15 and an increase in condensate production was observed in the period from 8/8/15 to 8/17/15.

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We have not seen any obvious response in vapor concentrations to depressurization based on PID (see below). We believe that the lack of response is related to the fact that the eductor system is removing most of

the steam phase getting into each extraction well, either directly by extracting the steam phase into the piping system or by condensing the steam (due to the feed water drop pipe acting like an in-well heat exchanger) and afterwards pumping the condensate out with the rest of the water extracted from the well. Unfortunately, when correlating the air stripper effluent PID concentrations with the pressure cycling events (not shown), we don't see any obvious peaks following depressurization either.

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It is also possible the smaller increases while depressurizing one zone (LSZ or UWBZ) are masked by the other zones. All our samples are focused on the combined air stripper and wellfield influent stream going to the oxidizer. We have seen vapor concentrations of petroleum hydrocarbons as JP-4 as high as 20,000 mg/m3 in the oxidizer influent. The saturated vapor concentration of hydrocarbons are expected to be a lot higher than that.

Thanks,

Gorm, Steffen and Devon

From: Davis, Eva [mailto:Davis.Eva@epa.gov]  
Sent: Friday, August 28, 2015 11:13 AM  
To: Devon Phelan; Steffen Griepke; Gorm Heron  
Cc: d'Almeida, Carolyn K.; Smallbeck, Donald R.  
Subject: ST-12 weekly report questions

Hi All -

The latest weekly report states that Accelerator 1 was brought back on line after the blower fan on air stripper 1 was replaced. How long were the air stripper and accelerator off line? I assume that this is the reason for the reduction in vapor extraction during the past week - and that now the vapor extraction rate has been increased again?

I'm curious as to why there have not been increases in vapor phase concentrations during pressure cycling - what are your thoughts on that? Could it be that the vapor is already pretty saturated and not able to hold more hydrocarbon vapors?

Thanks Eva